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Integration of Environmental Restoration and Decontamination and Dismantlement Requirements at the INEEL

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Integration of Environmental Restoration and Decontamination and Dismantlement Requirements at the Idaho National Engineering and Environmental Laboratory[a]

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ABSTRACT

In 1997, the Environmental Restoration Program at the Idaho National Engineering and Environmental Laboratory (INEEL) determined that it was necessary to remediate a Comprehensive Environmental Response and Liability Act (CERCLA) site to address the risk of subsurface petroleum contamination to human health and the environment. This cleanup project was conducted utilizing the Non-time Critical Removal Action process. Due to the close proximity (above the contaminated soil) of a number of above ground storage tanks and a building, the CERCLA project team worked closely with the D&D group to ensure all requirements for each program were met.

Lessons learned and regulatory requirements will be discussed in the paper, including the factors unknown to many ER personnel regarding the steps required to be completed prior to the dismantlement of structures. The paper will summarize the background associated with the site, why the removal action was conducted, the scope of the removal action, and the results. The emphasis of the paper will discuss the integration between ER and D&D requirements and processes. In the current environment where ER and D&D activities are commingled, it is imperative that ER and D&D personnel are aware of the requirements imposed upon each program. By working together and building upon the strengths of each program, the INEEL's 1997 removal action was a tremendous success.

INTRODUCTION

The Central Facilities Area (CFA) is located in the south-central portion of the Idaho National Engineering and Environmental Laboratory (INEEL), approximately 80 km (50 mi) west of Idaho Falls (see Figure 1). Originally built in the 1940s and 1950s to house Naval Gunnery Range personnel, CFA facilities have been modified over the years to fit the changing needs of the INEEL and currently house craft, office, service, and laboratory functions.

In July of 1997, a non-time-critical removal action was initiated to remediate a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site where a risk to human health and/or the environment was determined to exist. The CERCLA site is located within the boundary of the CFA.

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BACKGROUND

The CERCLA site, CFA-42 Tank Farm Pump Station Spills (Figure 2), includes the CFA Tank Farm (above ground storage tanks), a pumphouse with underground piping, a fuel rack, and the area near the former catch basins at the CFA Tank Farm where spills of fuel occurred. The CFA Tank Farm area was constructed in 1950 and was deactivated in 1994. This area was used for bulk storage of diesel fuel, gasoline, kerosene and white gas.

During the CERCLA investigation of this site it was discovered that releases from the tanks, fuel rack, and catch basins had occurred. These released to the environment were then determined to pose a unacceptable risk to human health and the environment. Consequently a removal action was proposed and initiated to remediate the site such that the contaminated soil would be cleaned up to acceptable risk-based levels which would eliminate the need for further remediation. Upon completion of the removal action the site was evaluated as part of a CFA-wide remedial investigation which verified there was no residual risk which needed to be addressed and/or remediated.

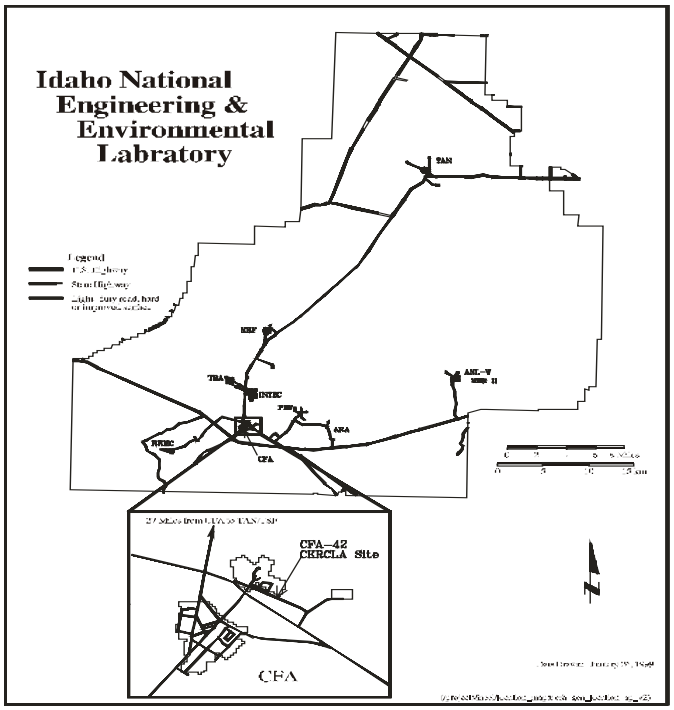

Figure 1. Location of the Central Facilities Area at the INEEL.

Figure 2. CFA-42 prior to removal action.

SCOPE OF THE REMOVAL ACTION

This removal action was performed to mitigate the risks identified in previous investigations and eliminate the need for any additional characterization or clean up under the WAG 4 comprehensive remedial investigation/feasibility study (RI/FS) for OU 4-13. The potential risks posed by CFA-42 were caused by polycyclic aromatic hydrocarbons, volatile organic compounds, and total petroleum hydrocarbon contaminated soils.

The following removal action objectives are contaminant specific and media specific goals for protecting human health:

- Provide for proper demolition, removal, and disposition of the fuel tanks, fueling station, fuel rack, and pump house located at CFA-42

- Minimize the risk to human health via soil ingestion, inhalation, dermal contact with soil, and groundwater pathways by

following guidelines provided in the Idaho Risk Based Correction Action Guidance

- Provide a mechanism for the disposition of soils and meet all cleanup levels so that no additional remedial actions would be required at the site
- Minimize contaminated waste soils generated during soil removal activities through the use of field screening
- Complete the project with no safety, industrial hygiene, or environmental incidents

Soils at CFA-42 were contaminated with petroleum products released from bulk storage tanks and associated fuel-handling facilities. Contaminant levels were greater than the state of Idaho's Risk Based Corrective Action Guidance "Tier 1" concentrations. The recommended action was soil excavation and ex-situ bioremediation treatment. Soil contaminants were degraded by microbial action under controlled conditions at the existing CFA Landfarm. The total cost for completing all required paperwork, removing and disposing of all structures, excavating of the contaminated soil and treatment of the contaminated soil was approximately $1,000,000. The volume of soil that was removed for treatment was approximately 9,200 m^3 (12,000 yd^3).

Demolition of the fuel storage tanks, fueling station, fuel rack, and pump house included a nonfriable-asbestos gasket removal at the pump house. Removal was conducted in accordance with Idaho National Engineering and Environmental Laboratory procedures.

The remainder of this paper will focus on the tasks required to be completed in order that the project would comply with both Comprehensive Environmental Compensation and Liability Act and Decommissioning and Dismantlement requirements. This will in turn help the reader to understand what work must be completed to meet the requirements of each program. Thus this information can be utilized to assist others with the successful integration of D&D and CERCLA activities.

INTEGRATION OF CERCLA AND D&D REQUIREMENTS AND PROCESSES

Removal of Structures Associated with CFA-42

As previously discussed there were 4 primary structures in addition to the above ground storage tanks at CFA-42 that were required to be demolished in order to ensure all contaminated soil was removed. These structures included 2 concrete barrier walls, a fueling platform or rack, and the pump house. At the beginning of the project, the team members assumed the concrete walls could simply be removed without complication. However these walls met the definition of a structure, thus the associated requirements as discussed below, applied to these as well as the fueling platform, tanks, and pump house.

Figure 3. CFA-42 removal of structures.

ER REQUIREMENTS ASSOCIATED WITH THE REMOVAL OF STRUCTURES

All typical requirements associated with a CERCLA remedial action applied to the removal action at CFA-42. These requirements, specific only to structure removal, include:

- Completion of the National Environmental Policy Act (NEPA) Environmental Checklist to ensure the proposed action was consistent with and covered by an existing NEPA Categorical Exclusion. This work required about 2 months to complete.

- Completion of an archeological survey of the site and surrounding area to ensure the area did not contain items or artifacts of archeological or historical significance that could prohibit the work from continuing. This activity required approximately 1 month to complete.

- Subsurface geophysical surveys were completed to determine the presence or absence of buried pipes, tanks, cables, or other objects to ensure no safety or operational problems arose due to the unexpected excavation, disruption, and/or destruction of these items. This activity required approximately 1 month to complete.

- Affected INEEL personnel were notified of the activities to ensure the removal action did not interfere with their plans and to verify with them that the proposed work would not disrupt facility specific services or utilities. This is another good opportunity for the project team to obtain an independent assessment of the project plan. This activity required approximately 1 week to complete.

- Outage permits were obtained to de-energize appropriate utilities to ensure there were no safety issues associated with the work. This activity required approximately 1 month to complete.

- The regulatory agency project representatives were involved in and concurred with the removal action plan. This activity required approximately 6 months to complete.

- A checklist of all necessary Environmental Restoration specific requirements is located in Table A-1 of this paper. This checklist, referred to by the INEEL as the Field Team Leader checklist is used throughout the INEEL for performing CERCLA activities. Obviously not all of these requirements apply to each project. Therefore the responsible parties must evaluate the merits of each requirement on a project specific basis. Some of the highlights or more important points of the checklist are discussed above. The complete checklist can be used by the reader to help ensure all requirements are met prior to beginning work. Clearly each remediation site may not have the same requirements, therefore the checklist serves as a stepping-off point from which to start.

D&D Requirements Associated with the Removal of Structures

The typical D&D requirements also applied to this removal action due to the removal of the structures. Specific requirements, which deserve to be mentioned, include:

- Completion of the Housing and Urban Development (HUD) notification to ensure that each structure was evaluated by HUD for a possible future use. All structures at this site were determined not to have a future use and consequently they were demolished. This activity required approximately 2 months to complete.

- Completion of the State Historic Preservation Office (SHPO) documentation to ensure the state of Idaho had the paperwork and photographs necessary to document the historical significance of the structures and to determine if there was any special work required prior to the demolition of the structures. This activity required approximately 2 months to complete.

- Completion of Asbestos sampling and analysis, including an evaluation of the data to ensure proper worker protection. This activity also includes notification to the state of Idaho Air Quality Unit and National Emission Standards for Hazardous Air Pollutants (NESHAPs) notification requirements. This activity required approximately 2 months to complete.

- Completion of sampling and analysis for other potential worker exposure contaminates such as lead. This activity helps determine the proper personnel protective equipment and facilitates the completion of the paperwork necessary to properly dispose of the waste (hazardous waste determination.) This activity required approximately 2 months to complete.

- Completion of treatment of the building(s) for Hanta virus as necessary to ensure worker protection. This work required approximately 1 week to complete.

- Completion of a fire hazards analysis report to ensure fire protection requirements are addressed and the proper precautions are taken. This activity required approximately 1 month to complete.

- Completion of a demolition plan which describes how the structures will be demolished. This activity required approximately 2 months to complete.

- A complete checklist of the requirements, which need to be completed when performing D&D operations, is found in Table A-2. As described previously, not all of these requirements are necessary for each project thus the project team must evaluate them all for applicability.

RESULTS OF THE REMOVAL ACTION

A. The removal action was successful in remediating the contaminated soil found at this site, thereby eliminating the need for further clean-up in the future. Although not typically part of the removal action process, the buildings and tanks were also removed from the site in order to allow the removal action to proceed and reach completion. Clearly there were lessons learned by the CERCLA team regarding the D&D requirements that must be adhered to when structures need to be demolished. These requirements are identified in the checklists found in Table A-1 and A-2.

B. A number of lessons were learned throughout the process of planning, performing, and completing this removal action. Specific lessons learned worthy of mention in this paper include:

- The CERCLA and D&D personnel must work closely together to build upon each others strengths and help one another over areas of weakness.

- The planning for such a project must be as detailed as possible. There are a multitude of potential problems that can be off-set if the up-front planning is complete.

- Work with and complete a comprehensive checklist. The two checklists provided in this paper are excellent sources of information and have been proven to be effective over the course of many years.

- Communication among all participants is a necessity. Clearly the CERCLA and D&D personnel must communicate but to be totally effective as a project the regulatory agencies, the customer, and all support staff must be knowledgeable about and concur with the plans for the project.

APPENDIX A

Table A-1. Field Team Leader Checklist.

Parameter	Yes	No	N/A	Remarks	Requirement/Procedure
PRE-JOB DOCUMENTATION (To be filled out by Project Manager)					
*Is the work being conducted under the following:					
Controlled, approved Characterization Plan, Health & Safety Documentation (please specify)					INEEL specific procedures
QPP-149, QAPjP Requirements					INEEL specific procedures
Auditable Safety Analysis (ASA), USQ, Hazard Classification, etc.					DOE Order 5480.21 DOE Order 5480.23 INEEL specific procedures
Environmental Checklist (EC) for the Categorical Exclusion (CX)					EM-A6, DOE Order 5440.1E 40 CFR 1500-1508
Outage request, as applicable.					INEEL specific procedures
Storm Water Pollution Prevention Plan(SWPPP)					DOE/ID-10425
Laboratory SOW in place, SOW #, Name of Lab(s)					INEEL specific procedures
Davis-Bacon determination					INEEL specific procedures
Site Work Release Number					INEEL specific procedures
Safe Work Permit Number					INEEL specific procedures
Radiological Work Permit Number					INEEL specific procedures
Project Manager send 14-day notice of beginning of field work to DOE or EPA/IDHW Notice sent on					Federal Facility Agreement and Consent Order
CHAIN-OF-CUSTODY/SHIPPING					
*****Verify with SMO					

Table A-1. (continued).

Parameter	Yes	No	N/A	Remarks	Requirement/Procedure
Lab has NRC license for radioactive material Exception: If sample has been classified non-radioactive per PRR-713					Policy letter from DOE-HQ (EM-30) clarifying requirements on the moratorium on Shipment of Hazardous Waste Originating in Radiologically Controlled Areas, June 7, 1991, Jill Lytle (author)
Laboratory has been notified samples are being sent					
*Have the following been scheduled?					
Certified hazardous materials shipper					INEEL specific procedures
Certified hazardous materials carrier					INEEL specific procedures
Radiological screening prior to shipment					INEEL specific procedures
Radiological Control Technician (RCT)					INEEL specific procedures
Subcontractor/matrix/crafts personnel scheduled?					
Photographer scheduled? (Dates)					INEEL specific procedures
Management Assessment, Quality Field Surveillance, independent assessment scheduled?					INEEL specific procedures
Survey of sample locations wells and other key reference points scheduled when required by FSP					INEEL specific procedures
Submit SMO Service Request Form.					INEEL specific procedures
*Have the following requirements/procedures been reviewed?					
Packaging/screening of non-hazardous materials					INEEL specific procedures
Requirements for notice to Packaging and Transportation shipping coordinator					INEEL specific procedures
*Are the following available?					
Chain-of-Custody Forms?					INEEL specific procedures
Hazardous Material Shipping Forms (ID 5480-3B)?					INEEL specific procedures
DAR(s)?					INEEL specific procedures
Labels/markings/placards?					INEEL specific procedures
Return address labels for shipping container?					INEEL specific procedures
Sample preservative/coolant?					INEEL specific procedures OSWER-9950.1

Table A-1. (continued).

Parameter	Yes	No	N/A	Remarks	Requirement/Procedure
Are preprinted sample labels complete?					INEEL specific procedures
*Are the following complete on COC forms?					
Analyses specified on COC consistent with SAP table and sample labels on bottle?					INEEL specific procedures
Sample IDs consistent with plan tables?					INEEL specific procedures
Sampler/FTL signatures?					INEEL specific procedures
*Are the following complete on COC forms?					
Project name?					INEEL specific procedures
FSP document #?					INEEL specific procedures
SOW or TOS #?					INEEL specific procedures
Sample date?					INEEL specific procedures
Relinquished by signature, date & time?					INEEL specific procedures
Does SAP document, logbooks, sample labels & COC agree?					INEEL specific procedures
Are COCs complete and reflect what is in shipping container?					INEEL specific procedures
Has a copy of COC been sent to SMO Field Data Coordinator?					INEEL specific procedures
Has air introduction been minimized for VOA samples?					SW 846, Volume IB Chapter 4 Section 4.1.2
Have VOA samples been "tapped" during filing and turned upside down to ensure no air is present in sample?					SW 846, Volume IB, Chapter 4, Section 4.1.2
Have filtered/unfiltered samples been taken/preserved properly?					SW 846, Volume IA Chapter 3 Section 3.1.2 and Table 3-1
Are samples sealed?					INEEL specific procedures
Are samples preserved (if required)?					INEEL specific procedures
Have sample containers been checked?					INEEL specific procedures
*Have the following been completed prior to shipping?					
Are labels affixed to samples?					INEEL specific procedures
Are samples screened by RML?					INEEL specific procedures
Shipping containers have the proper preservative (i.e. blue ice) when required?					INEEL specific procedures
Samples stored (packed) properly in shipping container?					INEEL specific procedures
*Have the following been completed prior to shipping?					
Copy of the COC in the shipping container					INEEL specific procedures

Table A-1. (continued).

Parameter	Yes	No	N/A	Remarks	Requirement/Procedure
Shipping containers have a custody seal?					INEEL specific procedures
Shipping container properly sealed for shipping?					INEEL specific procedures
Shipping container labeled per DOT?					INEEL specific procedures
*Characterization Plan					
Standard Operating Procedure(s) being used (if not in SAP)?					INEEL specific procedures
Are procedures approved and controlled?					INEEL specific procedures
Data gaps and sampling objectives reviewed by sampling team?					EPA 540-R-93-071
Critical samples reviewed by sampling team?					INEEL specific procedures
Completeness criteria reviewed by sampling team?					INEEL specific procedures
Sample numbering scheme reviewed?					INEEL specific procedures
Sample locations/depth/frequency reviewed by sampling team?					INEEL specific procedures
All short holding-time analyses identified and arrangements made?					SW-846 (EPA Document)
All Regular, QA/QC samples/ materials available?					INEEL specific procedures
All Regular, QA/QC sample types and collection methods reviewed by sampling team?					INEEL specific procedures
Sample equipment checklist completed?					INEEL specific procedures
Equipment maintenance requirements reviewed?					QAMS-005/80
Waste minimization/waste management strategy reviewed by sampling team?					INEEL specific procedures
Sample disposal/storage arranged?					INEEL specific procedures
DOCUMENT CONTROL					
*Have the following procedures been reviewed?					
MCP-230 (Document Control)					INEEL specific procedures
MCP-233 (Producing ER Reports)					INEEL specific procedures
*Are the appropriate logbooks present?					
Type: No:					INEEL specific procedures
* Health and Safety					

Table A-1. (continued).

Parameter	Yes	No	N/A	Remarks	Requirement/Procedure
Approved Health and Safety Plan (HASP), or approved equivalent documentation, specify document number					INEEL specific procedures
Approved SWP(s) obtained?					INEEL specific procedures
Approved RWP(s) obtained?					INEEL specific procedures
Are PPE as specified in HSP available?					INEEL specific procedures
All required training for task site personnel (as identified in Table 1 of the Health and Safety Plan) complete?					29 CFR 1910.120
Daily safety briefing requirements reviewed and documented in logbook? The following elements discussed (but not limited to) w/ respect to HASP:					29 CFR 1910.120
-MSDSs for all chemicals on site obtained and on site?					INEEL specific procedures
-All chemicals properly labeled?					INEEL specific procedures
-Site control procedures/boundaries (that is, exclusion zone, support zone, etc.) reviewed?					INEEL specific procedures
-Training requirements for each member of crew reviewed?					INEEL specific procedures
-Lifting/carrying cautions reviewed?					INEEL specific procedures
-Heat and/or cold stress reviewed?					INEEL specific procedures
-First aid kit(s) available?					INEEL specific procedures
-Fire extinguisher(s) inspected and available?					INEEL specific procedures
-Alternate FTL discussed?					INEEL specific procedures
-Alternate HSO discussed?					INEEL specific procedures
-Personnel (including non-workers) training requirements reviewed?					INEEL specific procedures
-Location for eating/ restrooms/showers known?					INEEL specific procedures
-Emergency response actions (such as, stop work, evacuation signal, take cover, etc.) and responsibilities reviewed (buddy system)?					INEEL specific procedures
-Evacuation/medical facility routes known and posted?					INEEL specific procedures
-Spill response actions and reporting reviewed (if applicable)?					INEEL specific procedures
-Radio/phones obtained?					INEEL specific procedures

Table A-1. (continued).

Parameter	Yes	No	N/A	Remarks	Requirement/Procedure
-Eye wash(es) available?					INEEL specific procedures
-SCBA(s) available (if applicable)?					INEEL specific procedures
-Spill kit(s) available?					INEEL specific procedures
-Potable water available?					INEEL specific procedures
-Site control boundaries—signs correct and properly placed?					INEEL specific procedures
-Visitors made aware of boundaries and zones?					INEEL specific procedures
-Visitors sign logbook?					INEEL specific procedures

Table A-2. Construction, Remedial Action and Decommissioning and Dismantlement Checklist.

Project Title		Current Status		Team Member
Item No.	Item Description	Closed	Open	Status
1.0	PROJECT DOCUMENTS			
1.1	Performance Specification is approved and issued.			
1.2	Environmental Compliance Chart and Documentation is approved and on file.			
1.3	Categorical Exclusion (CX) is approved.			
1.4	Baseline Quality Program Plan is approved and issued.			
1.5	Project Interface Agreement with Facility is approved and issued.			
1.6	Stormwater Pollution Prevention Plan is approved and issued.			
1.7	Site Health and Safety Plan is approved and issued.			
1.8	Quality Level Evaluation and Q-List is approved and issued.			
1.9	Auditable Safety Analysis (ASA)/Unreviewed Safety Question (USQ) signed.			
1.10	Housing and Urban Development Notification Complete			
1.11	State Historic Preservation Office Documentation Complete			
1.12	Personnel protection sampling with appropriate documentation and notifications complete			
2.0	VENDOR DATA SUBMITTALS			
2.1	Final RD/RA Work Plan.			
2.2	Sampling and Analysis Plan.			
2.3	Quality Assurance Project Plan.			
2.4	ES&H Program.			
2.5	ES&H Job Safety Analysis.			

Table A-2. (continued).

Project Title		Current Status		Team Member
Item No.	Item Description	Closed	Open	Status
2.6	ES&H Material Safety Data Sheets (MSDS) and SARA Title III Hazardous Materials List approved and issued.			
2.7	General CPM Construction Schedule.			
2.8	ES&H PCB Sample Analysis.			
2.9	Procurement/ES&H Personnel Resumes.			
2.10	ES&H Hazardous Materials Transport Program.			
2.11	ES&H Employee 29 CFR 1910.120 Medical Fitness Certifications.			
2.12	ES&H/Quality Employee Training Records.			
2.13	ES&H Fugitive Dust Generation Prevention.			
3.0	PROCEDURES AND WORK CONTROL DOCUMENTS			
3.1	A copy of all controlled documents controlling initial construction activities is available for use in the field.			
3.2	Required MSDSs are identified and present in the field.			
3.3	A Job Safety Analysis has been completed and approved for initial work activities.			
3.4	A Pre-Job Plan of the Day (POD) checklist has been prepared and the checklist identifies all required work permits.			
3.5	Emergency Notification List is posted in the field.			
3.6	Hanta virus evaluation and treatment complete			
3.7	Fire hazards analysis report complete			
3.8	Demolition plan complete			
4.0	PERSONNEL QUALIFICATION AND TRAINING			
4.1	All Contractor and Subcontractor field personnel involved with initial construction activities are identified.			
4.2	Required field personnel have received and passed a baseline physical exam within the last 1-2 years. (CERCLA)			
4.3	Field personnel (Subcontractor personnel, Construction Management (CM) personnel, industrial hygienist (IH), and RadTech have been trained in the following as applicable:			
	OSHA 29 CFR 1910.120 40 hour HAZWOPER			
	OSHA 29 CFR 1910.120 8 hour Supervisor			
	First Aid/CPR			
	Radiological Worker II/Respirator Training			
	Site Health and Safety Plan			
	Project Interface Agreement			

Table A-2. (continued).

Project Title		Current Status		Team Member
Item No.	Item Description	Closed	Open	Status
	Sampling and Analysis Plan			
	Quality Assurance Project Plan			
	Safety Documentation Requirements (i.e., USQ, ASA, etc.)			
	RD/RA Work Plan			
	RWMC site access training and escort training			
4.4	ES&H procedure training for field personnel is completed.			
5.0	EQUIPMENT, TOOLS, SUPPLIES AND PPE			
5.1	Construction equipment has been properly cleaned prior to being brought on site.			
5.2	Construction equipment has been inspected for ES&H requirements and deficiencies have been corrected.			
5.3	Government Furnished Equipment is identified and available.			
5.4	Personal Protective Equipment is identified and available.			
5.5	Medical and first aid supplies are identified and available.			
5.6	Fire protection equipment is identified and available.			
5.7	Emergency communication equipment is identified and available.			
5.8	Decontamination supplies are identified and available.			
5.9	Control Zone barrier materials are identified and available (Rad., Construction, CERCLA).			
5.10	Control Zone signs and posting materials are identified and available.			
5.11	Monitoring instruments are identified and available.			
5.12	Calibration schedules for monitoring equipment are prepared and available.			
5.13	Contractor has all sampling equipment required to support sampling effort (e.g., field logbooks, sample containers/bags).			
6.0	SUPPORT SERVICES, INTERFACES AND LOGISTICS			
6.1	Emergency response interface with Facility has been established.			
6.2	Arrangements for emergency evacuation transportation are in place.			
6.3	Industrial Hygiene support services have been arranged.			
6.4	RADCON tech support services have been arranged.			
6.5	Fire protection interface with Facility has been established.			

Table A-2. (continued).

Project Title		Current Status		Team Member
Item No.	Item Description	Closed	Open	Status
6.6	Interface(s) for Construction Safe Work Permits (CSWP), Radiation Work Permit (RWP), high voltage proximity permit, excavation permits, as required, have been established with the Facility.			
6.7	Initial list of hazardous materials and MSDSs has been provided to the Facility manager.			
6.8	Sample analysis support services have been arranged.			
6.9	Civil survey support services and Limitations and Validation have been arranged.			
6.10	Waste disposal (e.g., PPE) has been arranged.			
6.11	Electrical power has been arranged.			
7.0	MISCELLANEOUS PREREQUISITES			
7.1	There are no open NCRs which affect the planned construction work activities.			
7.2	A Certificate of Insurance is posted in the field.			